

REMARKS

Claims 1 and 3-7 are pending in this application, of which claims 1, 3 and 7 have been amended. Claim 2 has been cancelled. No new claims have been added.

The Examiner has required Figs. 1-3 be designated as "Prior Art". Accordingly, such corrected prints of Figs. 1-3 are attached hereto. If approved, these proposed drawing corrections will be incorporated into formal drawings to be filed prior to payment of the Issue Fee.

Claims 1, 3, 4 and 7 stand rejected under 35 USC §103(a) as unpatentable over U.S. Patent 3,787,716 to La France (hereinafter "**La France**") in view of U.S. Patent 5,373,120 to Barrett et al. (hereinafter "**Barrett et al.**").

Applicant respectfully traverses this rejection.

La France discloses a linear D.C. motor for a track guided vehicle, the motor stator consisting of a series of uniformly spaced permanent magnets mounted along the track acting in conjunction with a vehicle attached elongated "rotor". A series of D.C. excited coils in slots across the face of the rotor react with the air gap flux between the magnets and the rotor to propel the vehicle. Automatic controls are provided to sequence excitation of the coils and control coil current to maintain precise selected vehicle velocity and position and also to respond to commands to incrementally change vehicle position with respect to another vehicle traveling at the same velocity and to effect other vehicle operations.

Barrett et al. has been cited for teaching a smaller linear motor for reducing the scale of the apparatus of **La France**.

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Neither reference teaches field magnets each having a plurality of pairs of magnetic poles magnetized in the axial direction, as disclosed on page 15, lines 13-21 of the specification of the instant application.

Accordingly, claim 7 has been amended to recite this distinction.

The Examiner indicated that claim 2 would be allowable if rewritten in independent form. Accordingly, claim 2 has been cancelled and its limitations added to claim 1. Thus, the 35 USC §103(a) rejection should be withdrawn.

Claim 6 stands rejected under 35 USC §103(a) as unpatentable over La France in view of Barrett et al. and further in view of U.S. Patent 5,644,178 to Halm (hereinafter "Halm").

Applicant respectfully traverses this rejection.

Halm has been cited for filling the space between the stator and housing with non-magnetic material in column 4, lines 28-35, but, like the other cited references, fails to teach, mention or suggest the limitations in the amendments to claim 1, from which claim 6 depends.

Thus, the 35 USC §103(a) rejection should be withdrawn.

The Examiner has indicated that claim 5 would be allowable if rewritten in independent form. Applicant respectfully defers this action until a FINAL Office Action, if any, is received.

In view of the aforementioned amendments and accompanying remarks, claims 1 and 3-7, as amended, are in condition for allowance, which action, at an early date, is requested.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned "Version with markings to show changes made."

If, for any reason, it is felt that this application is not now in condition for allowance, the

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Examiner is requested to contact Applicant's undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicant respectfully petitions for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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PATENT TRADEMARK OFFICE

Enclosures: Version with markings to show changes made
Request for Approval of Drawing Corrections w/Figs 1-3 marked in red ink
Substitute Abstract of the Disclosure

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IN THE ABSTRACT:

Amend the Abstract as follows:

A high-thrust linear motor [has] having coils wound with a minimal blank space in slots of a magnetic member (core) to generate high thrust and permit smooth movement of a moving member. The high-thrust linear motor includes a magnetic member having a plurality of slots formed in series in an axial direction thereof. The slots extend from both sides of the magnetic member in opposite directions intersecting the axial direction in corresponding relation to each other. Coils having a plurality of phases are wound in respective pairs of slots on both sides of the magnetic member. Field magnets extend in the axial direction at both sides of the magnetic member so as to face an effective conductor portion of each coil. Each field magnet has a plurality of pairs of magnetic poles magnetized in the axial direction. According to a method of producing the high-thrust linear motor, coils are wound in respective pairs of slots on both sides of the magnetic member while the magnetic member is being rotated.

IN THE CLAIMS:

Cancel claim 2.

Please amend claims 1, 3 and 7 as follows:

1. (Amended) A high-thrust linear motor comprising:

a magnetic member having a plurality of slots formed in series in an axial direction thereof, said slots extending from both sides of said magnetic member in opposite directions intersecting said axial direction in corresponding relation to each other;

coils each wound in a pair of said slots on both sides of said magnetic member; and

field magnets extending in said axial direction at both sides of said magnetic member so as to face an effective conductor portion of each of said coils, said field magnets each having a plurality of pairs of magnetic poles magnetized in said axial direction,

wherein said coils have a plurality of phases and are wound in respective pairs of said slots in said magnetic member in such a manner that each pair of adjacent phases are different in electrical angle from each other.

3. A high-thrust linear motor according to claim 1 [or 2], further comprising:

a cover member for covering said magnetic member and said coils approximately entirely, exclusive of effective conductor portions of said magnetic member and said coils.

7. (Amended) A method of producing a high-thrust linear motor, said method comprising the steps of:

preparing a magnetic member having a plurality of slots formed in series in an axial direction thereof, said slots extending from both sides of said magnetic member in opposite directions intersecting said axial direction in corresponding relation to each other; and

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winding coils in respective pairs of said slots on both sides of said magnetic member while rotating said magnetic member,

said coils opposing field magnets extending in said axial direction at both sides of said magnetic member so as to face an effective conductor portion of each of said coils, said field magnets each having a plurality of pairs of magnetic poles magnetized in said axial direction.

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ABSTRACT OF THE DISCLOSURE:

A high-thrust linear motor having coils wound with a minimal blank space in slots of a magnetic member (core) to generate high thrust and permit smooth movement of a moving member. The high-thrust linear motor includes a magnetic member having a plurality of slots formed in series in an axial direction thereof. The slots extend from both sides of the magnetic member in opposite directions intersecting the axial direction in corresponding relation to each other. Coils having a plurality of phases are wound in respective pairs of slots on both sides of the magnetic member. Field magnets extend in the axial direction at both sides of the magnetic member so as to face an effective conductor portion of each coil. Each field magnet has a plurality of pairs of magnetic poles magnetized in the axial direction. According to a method of producing the high-thrust linear motor, coils are wound in respective pairs of slots on both sides of the magnetic member while the magnetic member is being rotated.